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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,288	03/24/2004	Junichi Karasawa	119222	3917
25944	7590	08/09/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			PHAM, LONG	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/807,288	KARASAWA ET AL.	
	Examiner	Art Unit	
	Long Pham	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 1,2 and 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 3-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 08/03/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of claims 3-12 in the reply filed on 06/02/05 is acknowledged. The traversal is on the ground(s) that see the election dated 06/02/05. This is not found persuasive because the searches of device invention and process invention are not coextensive.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 3-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuura et al. (US publication 2002/0177243) in combination with Schmid et al. (US publication 2003/0178660), Horii et al. (US publication 2003/0230773), Kimura (Japan patent 411087336), and Yamamichi (US publication 2002/0001165).

With respect to claims 3, 5, 8, and 11, Matsuura et al. teach a method of manufacturing a ferroelectric layer including space charges, wherein the space charges or crystal defect are inherently formed at least at one of an upper portion and a lower portion of the ferroelectric layer in a direction of the thickness of the ferroelectric layer by crystallization heat treatment in an oxidizing atmosphere or in which oxygen partial pressure is controlled. See [0027].

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With respect to claim 4, Matsuura et al. fail to teach that space charges that are of opposite charges are formed at opposite sides of the ferroelectric layer. Schmid et al. teach that opposite space charges are formed on opposite sides of a ferroelectric layer. See [0077].

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the above teaching of Schmid et al. in the method of Matsuura et al. to allow switching off of a device without influencing the storage dielectric capability. See the abstract.

Further with respect to claims 5 and 6, Matsuura et al. in combination with Schmid et al. teach a single layer ferroelectric film having space charges but fail to teach that the ferroelectric layer is a multi-layer ferroelectric film.

Horii et al. teach using a ferroelectric film having a multi-layer structure to improve its orientation. See [0034].

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate the above teaching of Horii et al. into the method of Matsuura et al. to attain the above advantage.

With respect to claims 9 and 12, Matsuura et al. fail to teach defect is generated by implantation of impurities.

Kimura teaches that defect can be generated by implantation of impurities.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to form defect by implantation of impurities in the method of Matsuura et al. to allow the formation of charges in the ferroelectric layer.

With respect to claims 7 and 10, Matsuura et al. fail to teach adding Pb to the ferroelectric layer.

Yamamichi teaches adding Pb to a ferroelectric layer to achieve high dielectric constant. See [0211].

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It would have been obvious to one of ordinary skill in the art of making semiconductor devices to add Pb to the ferroelectric layer in the method of Matsuura et al. to attain the above advantage.

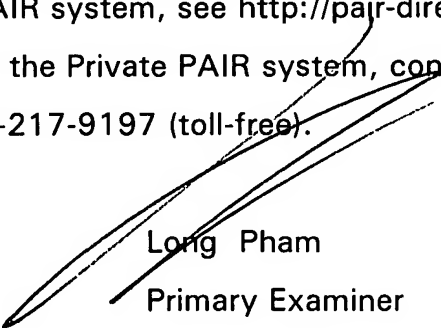
Further with respect to claim 7, the crystallization heat treatment of the ferroelectric layer having Pb would inherently create crystal defect in the ferroelectric layer.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 571-272-1714. The examiner can normally be reached on M-F, 7:30AM-3:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Long Pham
Primary Examiner
Art Unit 2814

LP

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